IDEAL AIR
Portable Air Conditioners
Model: 700881

SERVICE MANUAL

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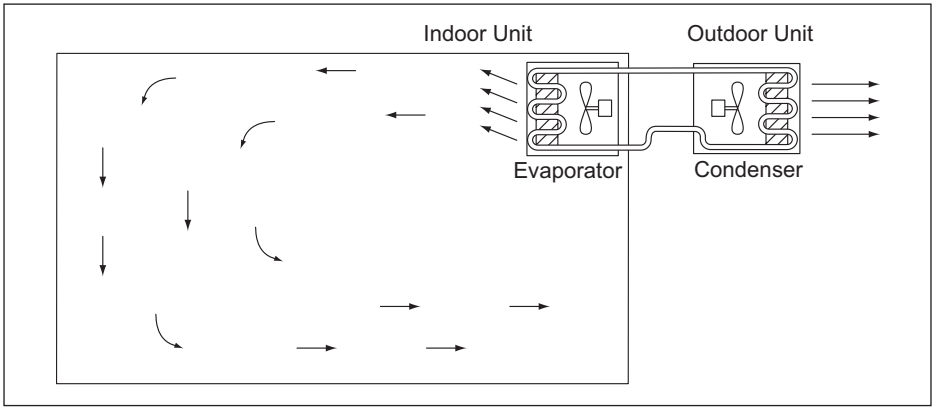
GENERAL DESCRIPTION

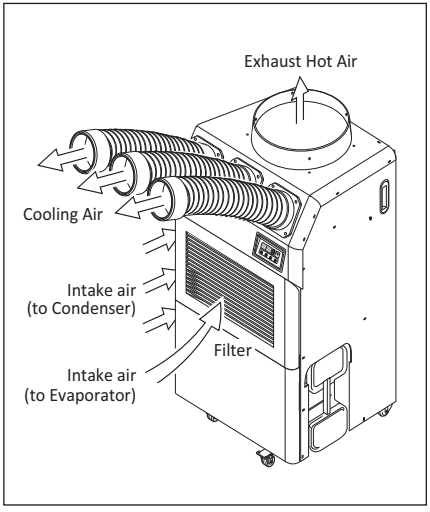
General air conditioning system

1) conventional air conditioners cool the entire enclosed environment.
2) They act as “heat exchangers”, equiring an interior unit (evaporator) to blow cool air into the interior and an exterior unit (condenser) to exhaust exchanged heat to the outdoors.



Portable air conditioning system

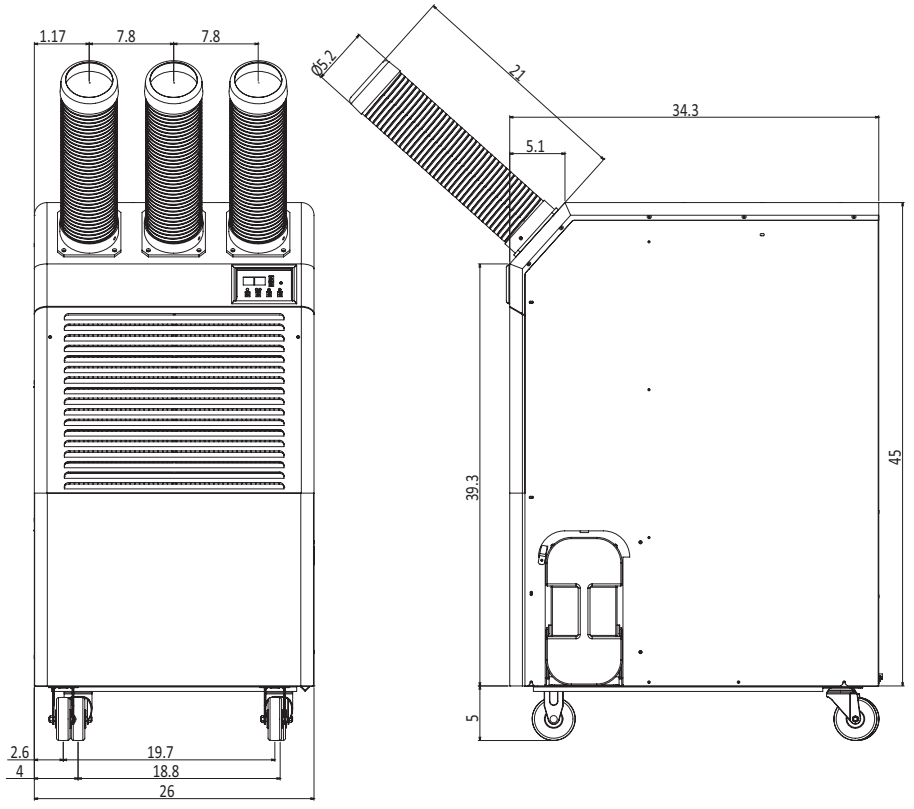
1) The 700881 is a spot cooler which directs cool air to particular areas or objects.
2) The 700881 has the following features.
3) The innovative design of the 700881 has resulted in one compact unit, replacing the need for two separate units.
4) With the whole cooling system built into one compact unit, the 700881 requires no piping and can be easily transported and installed.
5) The 700881 is economical because it cools only the area or objects which need to be cooled.



SPECIFICATIONS

Exterior Dimension Diagram

(Inch)

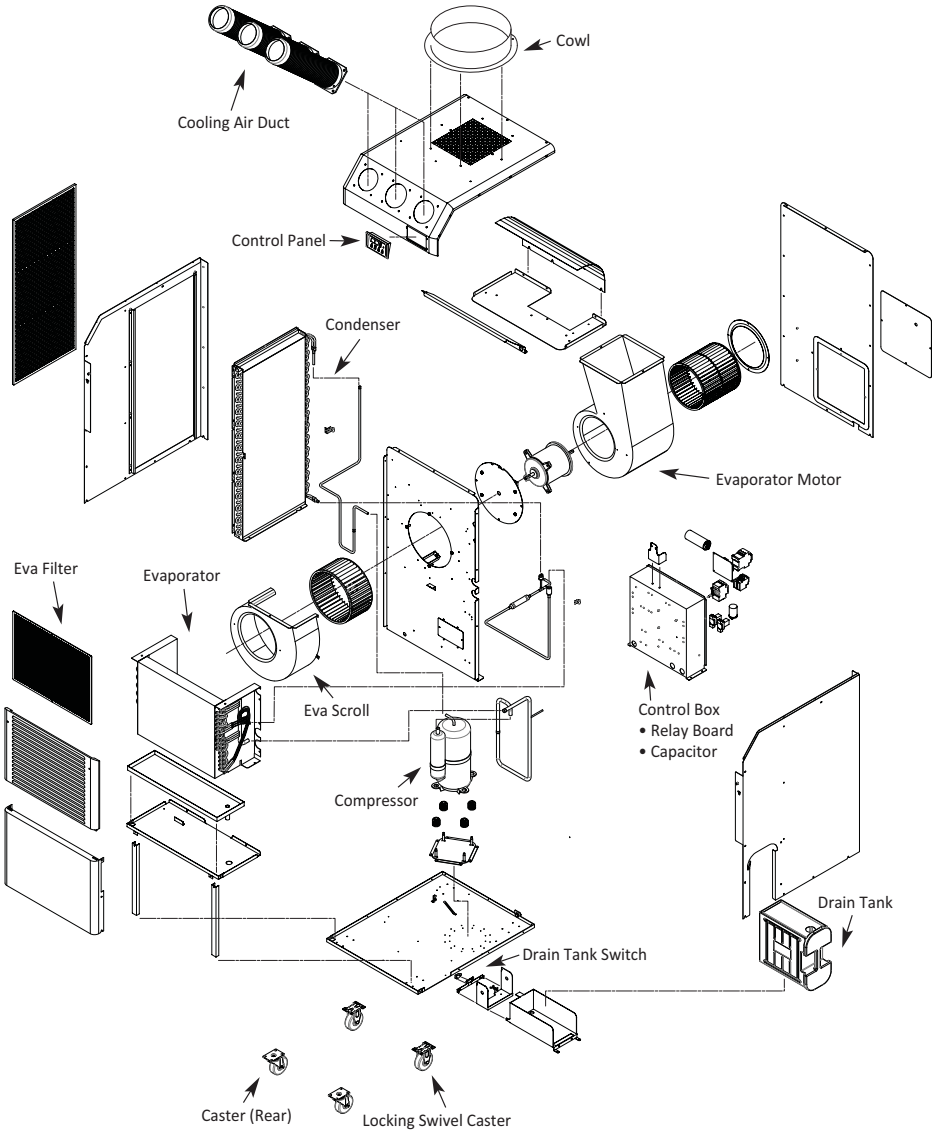


Technical Specifications

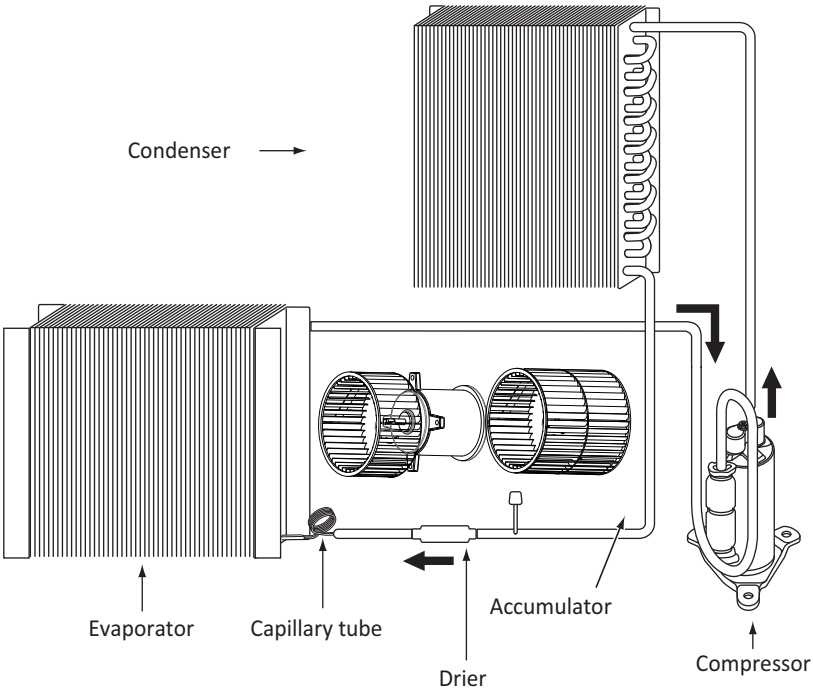
S0pecifications	Unit	700881
Cooling Capacity	Btu/h	37000
Power Supply	Phase	Single
	Volts	208 / 230
	Hertz	60
Power Consumption	Watts	4400
Rated Current	Amps	20 / 19
EER	Btu/Wh	10.6
Circuit Breaker Size	Amps	30
Nema Plug	Type	6-30p
Power Cord Gauge	Awg	10
Power Cord Length	ft	10
Dimensions (W x H x D)	In.(mm)	26 x 52.4 x 33.3 (660 x 1331 x 845)
Weight (Net / Gross)	Lbs(kg)	253 / 271 lbs.(115 / 123 kg)
Condensate tank	Gallons(Liters)	3.17 (12)
No. of Cool Air Outlets	Pcs	3
Ambient temperature range	˚F(˚C)	64~113 (18~45)
Setting temperature (Room cool mode)	˚F(˚C)	64~86 (18~30)
Setting temperature (Spot cool mode)	˚F(˚C)	32~86 (0~30)
Application Area (Room cool mode)	ft²(m²)	1300 (100)
Refrigerant	Type	R-410A
	oz(g)	61(1730)
Design Pressure - Hi/Low	Psig	450 / 250
Indoor Air Flow (High/Low)	CFM(CMM)	882 / 776 (1499 / 1318)
Wheels	pcs	4
	diameter	102mm
Hot Air Duct Diameter	In.(mm)	16 (400)
Maximum Duct Length	ft(m)	60 (18)
Safety Devices	Compressor overload protector, Anti-freezing thermister, Full drain tank switch, Autometic restart (Power interruption), Compressor time delay program, High pressure switch	
Features	Temperature control, Self-diagnostic function, Two sppeds fan, Optional drain pump kit, Washable filters, ˚F(˚C) display	

CONSTRUCTION

Internal Structure

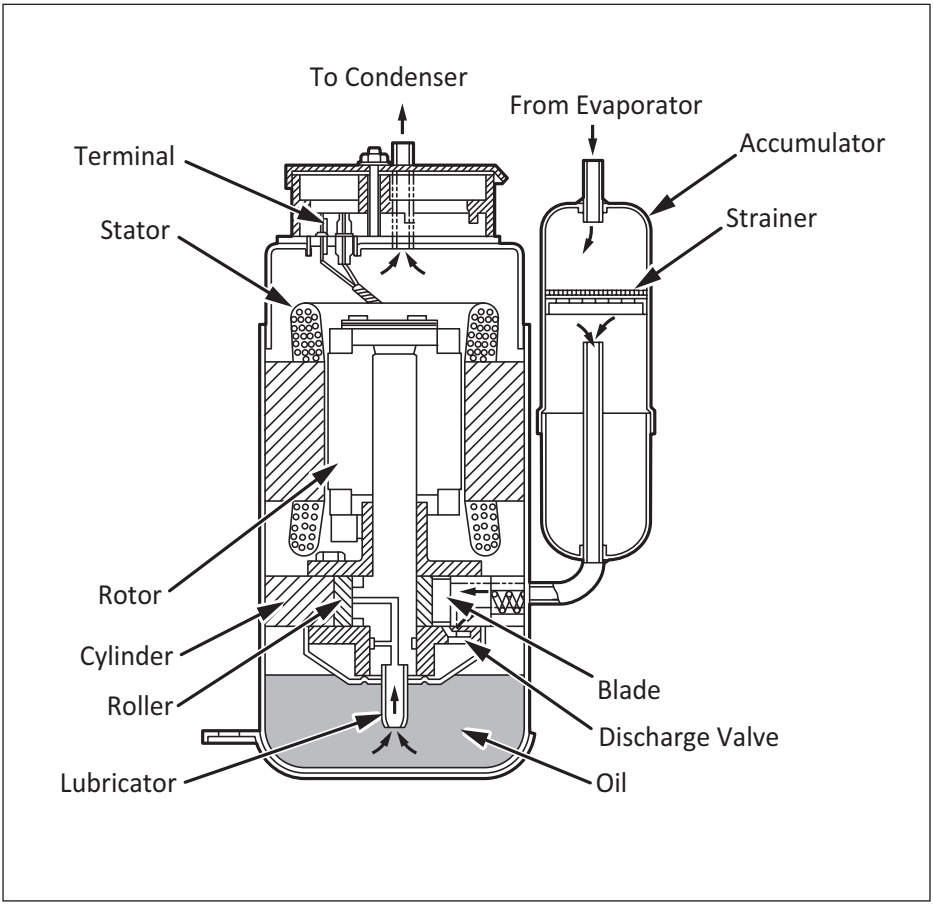


REFRIGERANT SYSTEM CONSTRUCTION



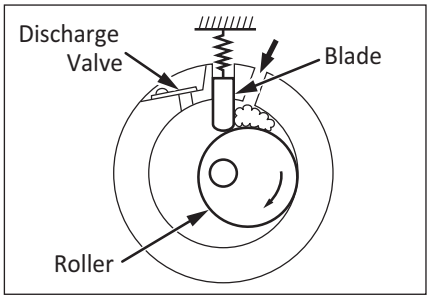
Compressor

The construction of a rotary type compressor is divided into two mechanisms; the drive mechanism (compressor motor), and the compression mechanism (compressor). When the rotor shaft of the motor (drive mechanism) turns, the roller (compression mechanism) rotates to compress the refrigerant.

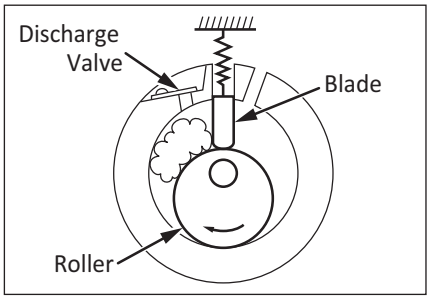


Compressor operation

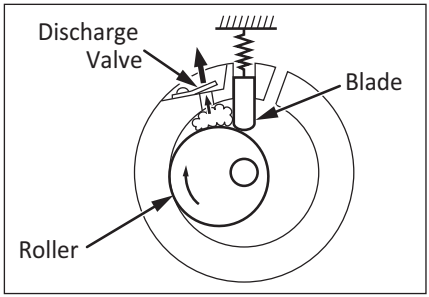
1) Start of compression
 1) The cylinder is filled with low pressure gas.
 2) Since pressure in the discharge chamber is higher than in the cylinder, the discharge valve is kept closed.



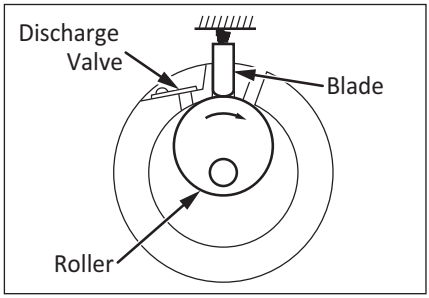
2) Suction and compression
 1) The pressure in the cylinder increases gradually.
 2) Refrigerant suction begins on the suction side of the cylinder.
 3) The discharge valve remains closed.



3) Discharge
 1) The pressure in the cylinder exceeds that in the discharge chamber, and the discharge valve opens.
 2) On the suction side, refrigerant suction continues.

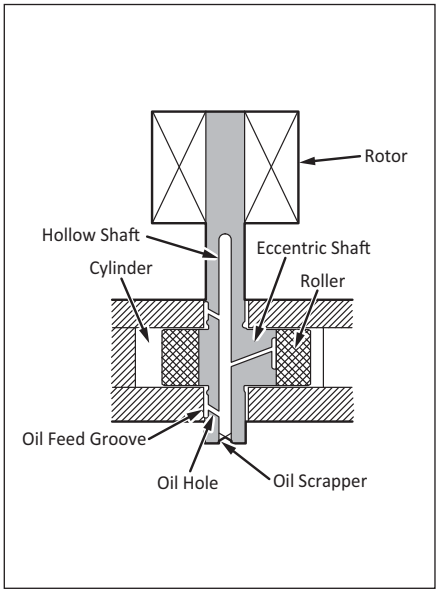


4) Completion of compression
 1) When compression is completed, all of the refrigerant has been drawn from the suction chamber.
 2) Operation then returns to step 1)(Start of compression) and the above process of suction and compression continues repeatedly in succession.



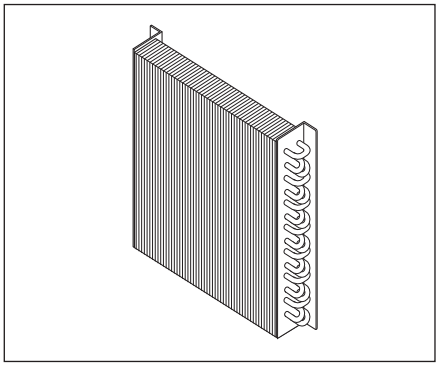
Compressor lubrication

The lubrication system is comprised of a hollow shaft, an oil scraper mounted at the end face, hollow shaft, a shaft journal (shaft bearing), and the lubrication groove for the shaft journal.
The lubrication groove is wider than the oil hole. When the shaft turns, oil is scraped upward by the oil scraper along the inside diameter of the hollow shaft. The oil is fed through the oil hole by centrifugal force, then supplied to the lubrication groove for each shaft journal, lubricating the bearing.
In this lubrication system, oil enters into each bearing separately and returns to the oil reservoir. This system effectively prevents bearing temperature increases, and offers high reliability.
In addition, the specially treated shaft journal keeps the bearing from being
damaged during high temperature operation.

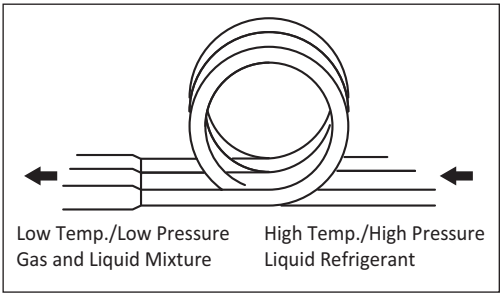


Condenser

1) The condenser is a heat exchanger with Louver fins.
2) Heat is given off and absorbed by air being pulled across the condenser fins by the axial fan. The air is then expelled through the condenser air outlet.

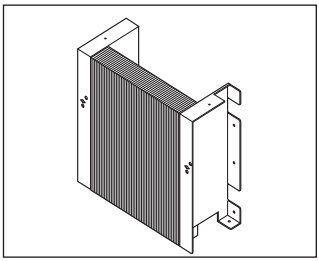


Capillary Tube



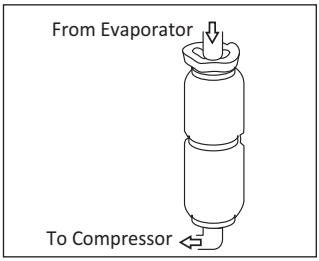
The capillary tube is a long thin tube that utilizes line flow resistance as an expansion valve. The length and the inner diameter of the capillary tube are determined according to the capacity of the refrigeration system, operating conditions, and the amount of refrigerant. The high pressure, high temperature liquid refrigerant sent from the condenser expands rapidly as the refrigerant is sprayed out through the fixed orifice in the capillary tube. As a result, the temperature and state of the refrigerant becomes low and mist-like, and therefore evaporates easily.

Evaporator



The evaporator is a heat exchanger covered with slit fins. Heat is removed from the air being pulled across the evaporator by the centrifugal fan.
The resulting cool air is expelled through the cooling air ducts.

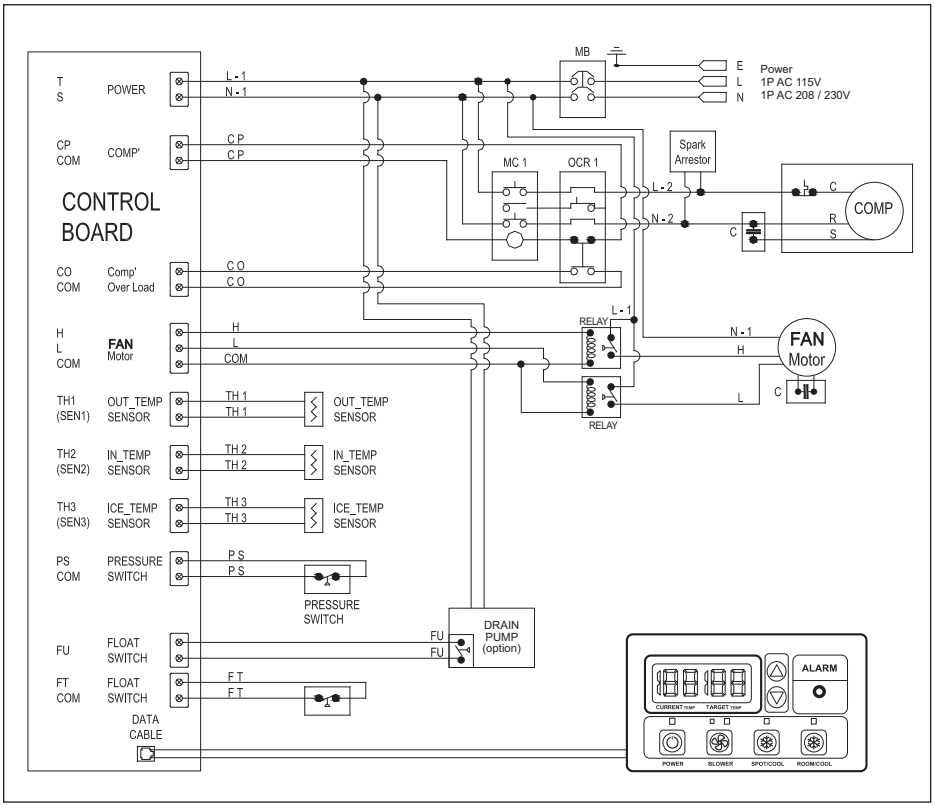
Accumulator



The accumulator is mounted on the suction gas piping between the evaporator and the compressor.
The accumulator separates the liquid refrigerant from the gas refrigerant, allowing only the gas refrigerant to enter the compressor. In the accumulator, suction gas isled into a cylindrical vessel where the speed of the gas is decreased.
This process separates the refrigerant contained in the gas by the force of gravity, causing the refrigerant to accumulate at the bottom of the vessel. As a result, the compressor is protected from possible damage caused by liquid refrigerant intake.

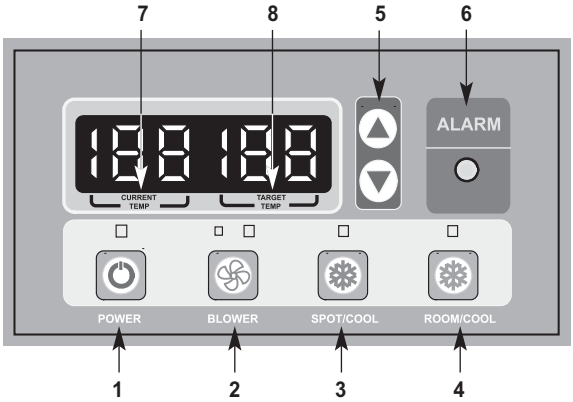
ELECTRICAL SYSTEM

Circuit Diagram



Control panel

Before operating the unit, it is important to be familiar with the basic operation of the control panel.



1. POWER BUTTON

- Activates unit when POWER BUTTON is pressed.
- Fan starts on low speed.
- If POWER BUTTON is pressed during operation, unit stops.

2. BLOWER BUTTON

- Changes fan speed from LOW to HIGH when pressed.

3. SPOT / COOL BUTTON

- Activates compressor and begins producing cool air 5 seconds after button is pressed.
- Regulates temperature based on outlet cool air temperature.

4. ROOM / COOL BUTTON

- Activates compressor and produces cool air 5 seconds after button is pressed.
- Regulates temperature based on inlet ambient air temperature.

5. SET TEMP BUTTON

- Change target temperature / data value by ± 1.
- Change data value by ± 10 by pressing continually.
- Press the SET TEMP BUTTONS to set temperature.
- Upper button is to heighten temperature and Lower button is to lower temperature.

6. ALARM

- Alarm indicator light blinks and indicates abnormal system operation.
- If Alarm occurs, compressor stops.
- System operation stops when ALARM light is activated / blinking longer than 3 minutes.

7. CURRENT TEMP

- Room cool mode displays current room temperature in display in Fahrenheit.
- SPOT / COOL Mode displays outlet (cool air) temperature during normal operations.
- In order to change °F to °C, press SPOT / COOL and ROOM / COOL buttons together for 2 seconds.
- C will blink 2 times and the figure will change to °C
- ALARM codes blink and are displayed when abnormal operation occurs.

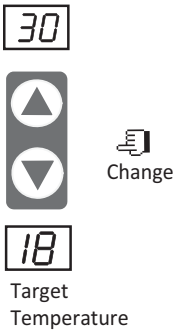
8. TARGET TEMP

- Displays the unit set temperature for ROOM COOL mode only.

NOTE:The room temperature display range is from 14 °F to 122 °F.
(When displayed in "°C " the range is from -10 °C to 50 °C)

Program Setting

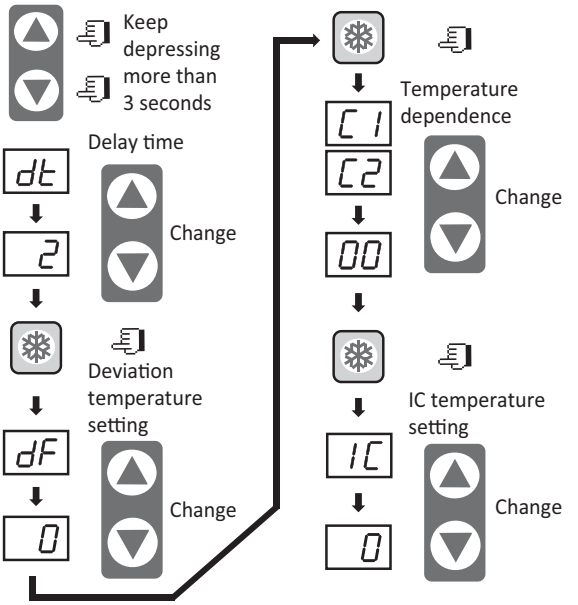
Temperature Setting



Power Switch

ON/OFF when keep depressing more than 1 seconds

Program Setting (Auto restored when no setting is made in each mode)



Indication	Description	the range of setting
dt	Delay time setting of COMP operation. EX)If setting is 3mins, it takes 3mins to be ON after COMP is OFF.	1-5minutes, control is available per 1 minute
dF	Deviation temp setting. Ex)It operates between 30℃ to 34℃(±2℃),if dF setting is 2℃ under 32℃(temp setting).	1℃ ~ 5℃
C1	Temperature Correction	-10℃ ~ +10℃
C2	Temperature Correction	-10℃ ~ +10℃
IC	IC temperature setting (Frost prevention sensor)	-5℃ ~ +5℃

Relay Board

The relay board contains the compressor and fan on relays, in addition to a step-down transformer that converts the line voltage (700881: 208/230 VAC) to 12V. This voltage is then converted from AC to DC and used for relay coil activation. The 12 V (DC) power is sent to the control panel assembly.

1) Power supply requirements
   700881 requires a single-phase 208/230 V, 60 Hz power supply.

2) Relay board fuse
   The relay board fuse is the only serviceable component on the relay board assembly. This fuse provides protection against damage to the step-down transformer. The fuse must be replaced with the exact same part, or a suitable equivalent.

Specifications : 3.15 A 250 VAC

CAUTION ***Failure to use the exact same fuse may result in damage to the unit and/or components, and will also void the unit warranty.***

3) Input Signal

The relay board receives inputs from the control panel, sensors, and external devices to perform device control.

Control Panel Input

Symbol	Indication	Function	Connector
	ON/OFF Button	If POWER BUTTON is pressed during operation, unit stops.	CON8
	FAN Button	Changes fan speed from LOW to HIGH when pressed.	
	SET TEMP△Button	Regulates temperature based on outlet cool air temperature.	
	SET TEMP▽Button	Regulates temperature based on inlet ambient air temperature.	

Sensor Input

Symbol	Type	Specification			Connector
		Characteristic	"Short"Detection	"Open"Detection	
TH1	OUT TEMP SENSOR	10 k ohm at 77 °F (25 °C)	181 °F (83 °C) or more	-29 °F (-34 °C) or less	TH1
TH2	IN TEMP SENSOR	10 k ohm at 77 °F (25 °C)	181 °F (83 °C) or more	-29 °F (-34 °C) or less	TH2
TH3	ICE TEMP SENSOR	10 k ohm at 77 °F (25 °C)	181 °F (83 °C) or more	-29 °F (-34 °C) or less	TH3

External Input Signal Specification

Symbol	Signal	Specification	Function	Connector
CO	Comp Overload	On: Between 10 to 20 mA at DC12 V (Off: No signal)	On: Activates "Defect control" (Contact: Normally open) LED shows "CO", Output signal"ON"	CO
FU	External Pump Failure	On: Between 10 to 20 mA at DC12 V (Off: signal)	Off: Activates "Defect control" (Contact: Normally open) LED shows "FU", Output signal"ON"	FU
PS	Pressure Switch	On: Between 10 to 20 mA at DC12 V (Off: signal)	On: Activates "Defect control" (Contact: Normally closed) LED shows "PS" output signal "ON"	PS
FT	Tank Full Switch	On: Between 10 to 20 mA at DC12 V (Off: signal)	On: Activates "Defect control" (Contact: Normally closed) LED shows "FT", Output signal"ON"	FT

Control Specifications

1) EVAPORATOR FAN MOTOR

• When the BLOWER button is pressed, the RL1/3 (fan motor HI/LOW) relay on the relay board turns on, operating the fan.

Specifications:

- RL1/3 (Fan motor HI-LOW) relay output: 10 A at AC 250 V

2) Compressor start control

• When the ON/OFF button is pressed, the RL4 relay on the relay board turns on, operating the compressor.

Specifications:

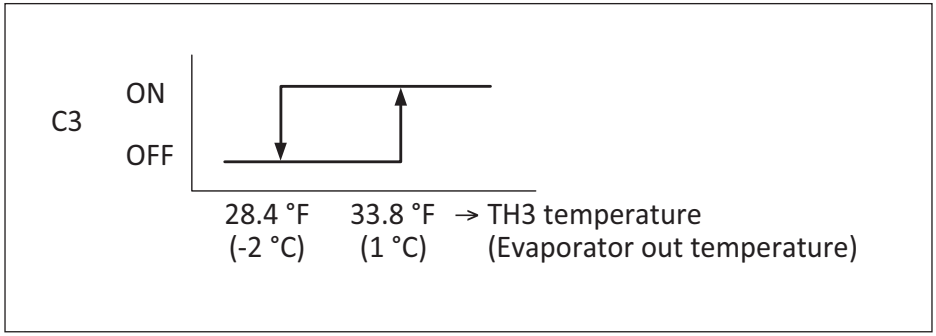
- RL4 (Compressor On-Off) relay output: 5 A at AC 250 V

3) Anti-freeze control

• Anti-freeze controls turns the compressor on and off by turning the RL4 relay on in accordance with the freeze protection thermistor (TH3) temperature. As a result, decreases in cooling performance due to frost buildup on the evaporator are prevented.

• Compressor off conditions: Freeze protection thermistor (TH3) temperature ≤ 28.4 °F (-2 °C)

• Compressor on (recovery) conditions: TH3 (ICE temperature) ≥ 33.8 °F (1 °C)



4) Compressor time delay control (compressor protection)

Compressor protection consists of a time delay program within the microprocessor. This program prevents a heavy load from being applied to the compressor motor when restarting the unit (room/cool mode or spot/cool mode) after a very short period of time. This “delay” is in effect any time the compressor is turned on by either the POWER ON/OFF button or ROOM/COOL or SPOT/COOL ON/OFF button.

Specifications:

- Time Delay: 120 sec.

5) Automatic restart and recovery function

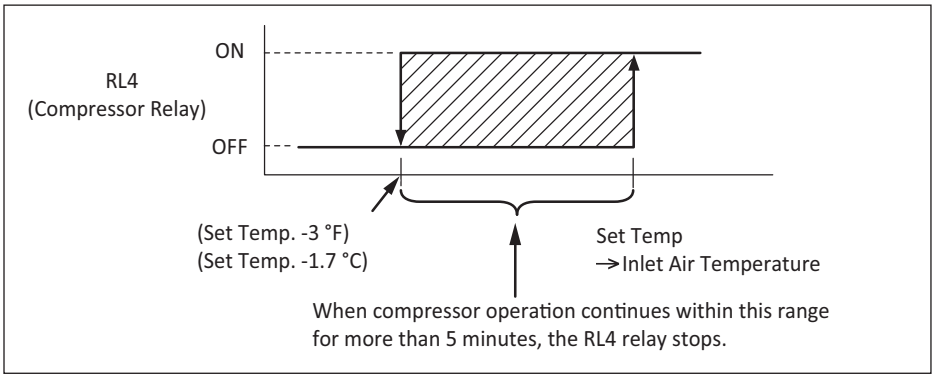
• The microprocessor contains a feature that automatically restart the unit after power is lost and regained, and also has memory to store and recover operation status in the even of a power loss.

Status of memory during power interruption

• When the input power is off, the status items below are saved in the memory.
- Running status (on or off)
- Operating mode: Cool mode or fan only mode
- Set temperature
- Temperature mode (°F or °C)

6) Temperature control

• During cool mode, temperature control changes the RL4 (compressor on/off) relay status according to TH3 temperature in the available range(-4 °F to 140 °F (-20 °C to 60 °C)).

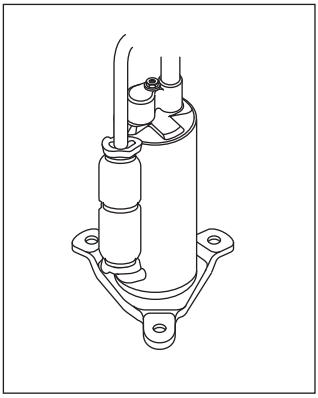


Self-Diagnostic Codes

Self-diagnostic codes are displayed on the Display Panel under the following conditions.

Alarm Display	Problem	Cause	Corrective Action
	Frost prevention sensor and Abnormal temperature sensor value	• Indoor heat exchanger temperature too low • TH3 temperature sensor has a loose or broken connection	• Do not use the air conditioner if ambient temperature is lower than 18°C (64°F) • Contact a qualified service agent
	Refrigerant high pressure switch	• Blocked air filter • Blocked / kinked exhaust duct • Ambient temperature is too high	• Clean air filter • Ensure exhaust duct is not blocked / kinked • Do not use the air conditioner if ambient temperature is higher than 45°C (113°F)
	Abnormal temperature sensor value	TH1(Outlet) temperature sensor has a loose or broken connection	Contact a qualified service agent
	Abnormal temperature sensor value	TH2(Inlet) temperature sensor has a loose or broken connection	Contact a qualified service agent
	Compressor overloaded	• Ambient temperature is too high • Unstable voltage supply • Defective compressor	• Do not use the air conditioner if ambient temperature is higher than 45°C (113°F) • Contact a qualified service agent • Replace compressor
	Condensate water level alarm	Condensate tank is full	• Empty the water tank • After installation of the water tank, press the SPOT/COOL or ROOM/COOL button to resume operation
	Drain pump alarm	Drain pump defective or improper hose connection (including kink or blockage)	• Check the hose connection and hose • Replace drain pump

Compressor



1) Compressor motor

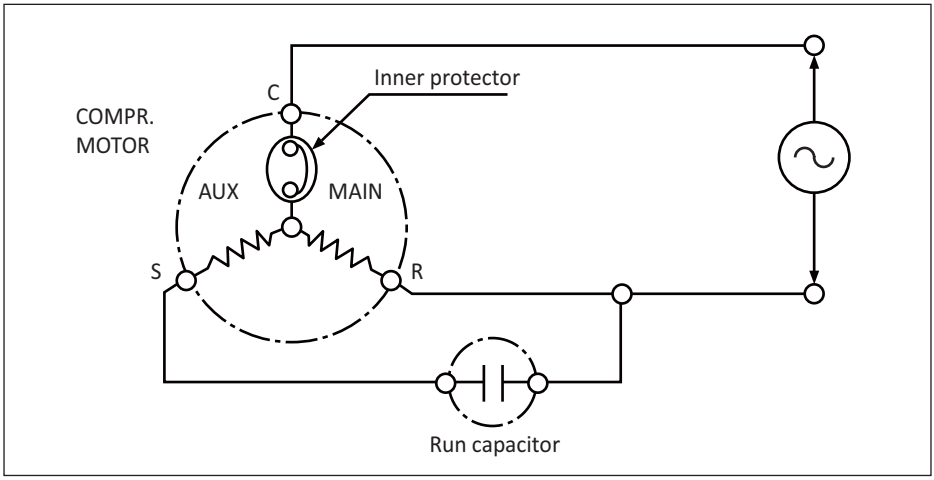
- The compressor motor is a single-phase motor and is contained within the same housing as the compressor.

Specifications:

	Rated Voltage	Rated Output
700881	208/230 V	2200W ±5%

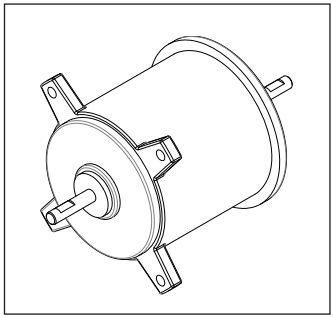
2) Compressor overload relay

- The compressor overload relay is used to protect the compressor motor. The relay interrupts the flow of current when there is an overload condition and, high temperature builds up in the compressor.



Fan Motor

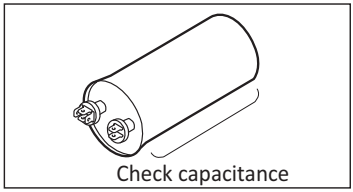
- The fan motor is a single phase, induction type. The motor rotates the fan on both the evaporator side and the condenser side at the same time.
- The following table shows the specifications of the fan motor used for each model.



NOTE: An internal overload relay is used to protect the fan motor. This relay is built into the fan motor and interrupts the flow of current when there is an over current situation, or if abnormally high temperature builds up in the fan motor.

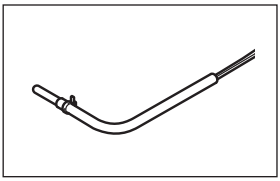
Capacitor Capacitor

- The capacitor is used to improve the rotational power of the fan motor and compressor at start up. The specification for each capacitor is shown below.


Check capacitance

	Capacitor	Rated Voltage	Capacitance
700881	Compressor	380 v	60 µF
	Fan Motor	450 v	27 µF

Temperature Sensor

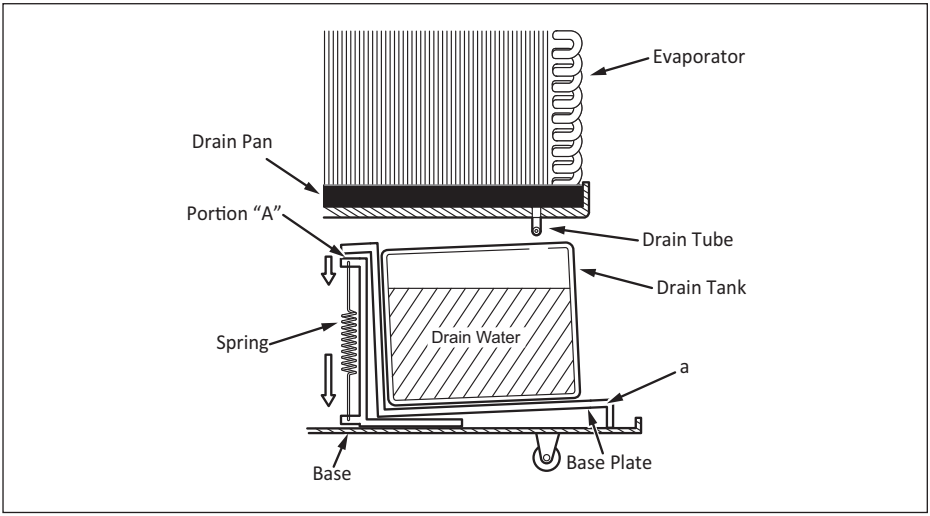


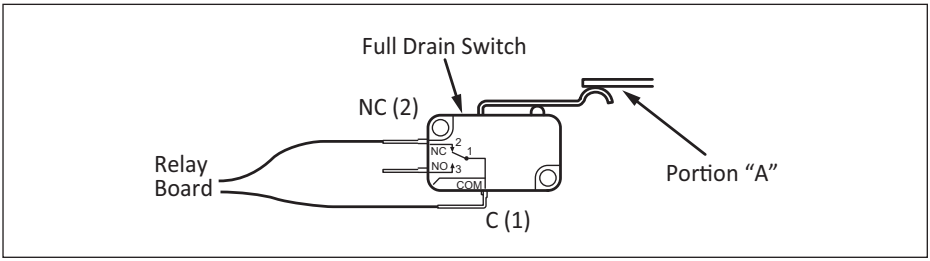
- Outlet temp sensor (TH1) is installed on top of the evaporator, and detects evaporator outlet temperature as a resistance value.
- Inlet temp sensor (TH2) is installed in front of evaporator, and detects evaporator inlet temperature as a resistance value.
- Ice temp sensor (TH3) is installed in the evaporator outlet piping, and detects low temperature on the evaporator as a resistance value.

Symbol	Type	Specification			Connector
		Characteristic	"Short"Detection	"Open"Detection	
TH1	OUT TEMP SENSOR	10 k ohm at 77 °F (25 °C)	181 °F (83 °C) or more	-29 °F (-34 °C) or less	TH1
TH2	IN TEMP SENSOR	10 k ohm at 77 °F (25 °C)	181 °F (83 °C) or more	-29 °F (-34 °C) or less	TH2
TH3	ICE TEMP SENSOR	10 k ohm at 77 °F (25 °C)	181 °F (83 °C) or more	-29 °F (-34 °C) or less	TH3

Drain Tank Switch

- The drain switch activates and stop the operation of compressor motor and fan motor when approximately 3.17 gal (12 L) of drain water accumulates in the drain tank. At the same time, control panel display “FL”, and compressor and fan operations stop. This system uses a 250 V, 0.1 A rating micro switch for this function.
- When approximately 3.17 gal (12 L) of drain water accumulates in the drain tank, the drain tank base plate, which is supported at fulcrum (a), is pushed down in the direction of the arrow.
- When the drain tank base plate is forced down, “portion A”, located at the top of the drain tank base plate, turns off micro switch contacts (1)-(2).





ASSEMBLY

Component parts

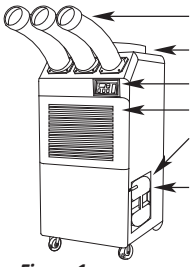

Cool air outlet hose
Top fan exhaust flange
Display / Control board
Evaporator / filter
Guide bar for condensate water tank
Condensate water tank (Water level is sensed, and the unit operation is stopped when tank is full. An alarm will be displayed. Empty the tank and replace to resume operation)

Figure 1
-Front and Right Side View

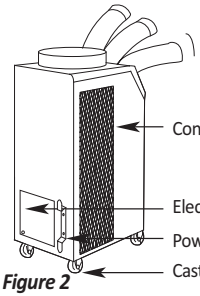


Figure 2
-Back and Left Side View

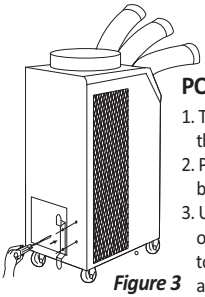


Figure 3

POWER CORD HOLDER

1. Take out the cord holder from the accessory box.
2. Place the cord holder on the back side of air conditioner.
3. Use screws (enclosed inside of accessory box with cord holder) to install the cord holder on the air conditioner as shown in Figure 3.

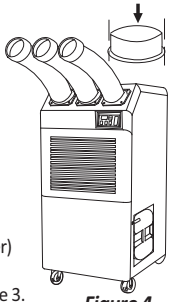


Figure 4

TOP FAN EXHAUST FLANGE

1. Remove the top fan exhaust flange from carton.
2. Place the top fan exhaust flange on the top of air conditioner.
3. Use screws (enclosed inside of box with the top fan exhaust flange) to install the top fan exhaust flange on air conditioner as shown in Figure 4.

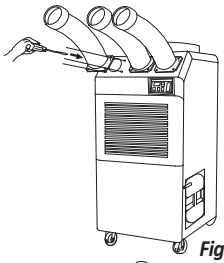


Figure 5

DISCHARGE DUCTS/SUPPLY AIR DUCT

1. Remove cool air outlet hose(s) from carton.
2. Place the cool air outlet hose(s) on the front top of air conditioner.
3. Use screws (enclosed inside of box with cool air outlet hose(s) to install the cool air outlet hose(s) on the air conditioner as shown in Figure 5.

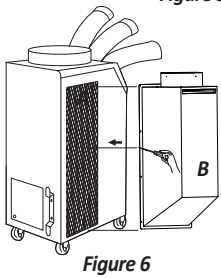


Figure 6

AMBIENT AIR ADAPTER (Optional)

An ambient air adapter can be purchased separately. Air adapter fits over the condenser to duct condenser air to the unit to improve cooling efficiency.

1. Remove the Filter("A")
2. Check the Filter("C") is inserted properly in Intake Warm Air Duct("B")
3. Install "B" which contains "C" by using driver with enclosed bolts(6EA) as Figure 6.

General Safety Information

Please read this manual carefully for instructions on correct installation and usage. Please read all safeguards.

1. Transport and store the unit in an upright position only. Leave unit in an upright position for at least 3 hours before first use.
2. Always place the unit on an even, level surface.
3. Ensure the unit is connected to a grounded power supply of the correct rating / capacity.
4. The unit will cool when the room temperature is between 18°C (64.4°F) ~ 45°C(113°F) depending on the thermostat setting.
5. DO NOT use this unit for functions other than those described in this instruction manual.
6. DO NOT tilt the unit.
7. DO NOT cover or obstruct the unit's inlet and outlet grilles.
8. DO NOT use the unit in areas where it will be exposed to rain or water.
9. NEVER unplug the unit while it is operating.

WARNING ***DO NOT use the unit in wet environments, such as a laundry room, to avoid the risk of electrical shock.***

10. DO NOT place any foreign objects on the unit.
11. DO NOT operate the unit with wet or damp hands.
12. DO NOT allow chemical substances to come into contact with the unit.
13. DO NOT operate the unit in the presence of flammable substances or vapors such as alcohols, pesticides, gasoline, etc.

WARNING ***DO NOT operate the unit in explosive or flammable environments.***

14. DO NOT use the plug to start and to stop the unit. Always use the control panel to start and to stop the unit.
15. Always turn off the unit when it is not in use and unplug the power plug from the electrical outlet.
16. Always turn the unit off and unplug the main power plug from the electrical outlet before cleaning, moving or performing maintenance.

17. AVOID the use of adapter plugs or extension cords. If it is necessary to use an extension cord or an adapter plug to operate the unit, ensure that they are correctly rated for the application. Consult a local qualified electrician and all local electrical codes to ensure proper setup. Any extension cord used with this device must be rated for a minimum of 15A.
18. DO NOT unplug the unit by pulling on the electrical cord. Keep electrical cord away from heat sources and always completely unroll the cord to avoid overheating. If the power cord becomes damaged, a qualified service agent, qualified electrician, or similarly qualified person must replace it, in order to avoid a hazard or shock.

WARNING ***DO NOT operate a unit with a damaged power cord.***

19. The filters must be used with the product at all times. When the filters are removed for cleaning, always ensure that the unit has been turned off and unplugged from the electrical outlet.
20. Regularly clean the filters to maintain efficiency. If the filters are not cleaned regularly, the units output performance and efficiency will decline and energy consumption will increase.
21. DO NOT operate the unit with a damaged power cord or plug, after it malfunctions, has been dropped or damaged.
22. Only use in the upright position on an even, flat surface. Unit must be positioned at least 24 inches (60 cm) from the nearest object in any direction.
23. Stop operation immediately if abnormal noise or odor is noticed. Contact a local service center.
24. Appliance is not to used by children or persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.
25. Children being supervised not to play with appliance.
26. That the appliance shall be installed in accordance with national wiring regulations.
27. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

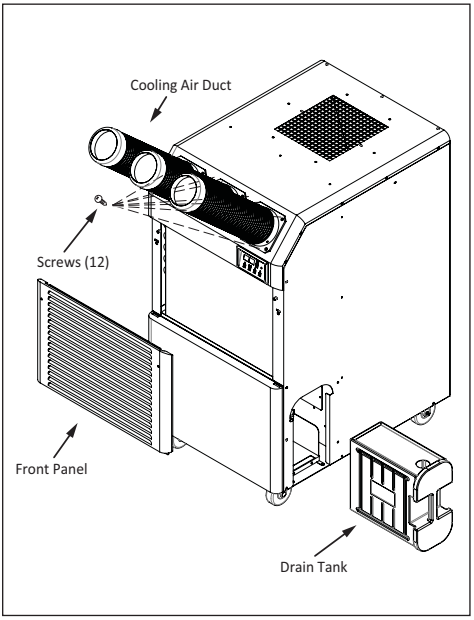
SAVE THESE INSTRUCTIONS

Troubleshooting chart

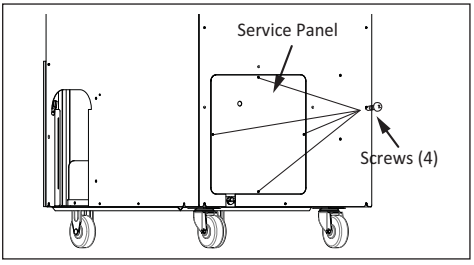
Symptom	Possible Cause(s)	Corrective Action
Water leakage	High water level in condensate tank	1. Remove blockage from drain hose 2. Remove any object stuck undeerneath of the black panel nuder the water tank
The unit doesn't work	1. Check the power supply to verify that power is available to the unit 2. Verify that the power cord is connected	1. Reset the circuit breaker and restart the unit 2. Connect power cord
No cold air flows from the cold air outlet	1. Ambient air cannot be properly cooled if the filter is dirty and not regularly cleaned 2. Compressor will not work if the unit isturned off and on quickly. 3. The ambient air temperature may be too high	1. Clean the filter 2. Wait 2 minutes after unit is turned off before turning the unit back on. 3. The temperature of the compressor can be higher when the ambient temperature is too high. The compressor will not work unless the ambient air temperature is within the acceptable operating range of the unit
Water flow can be heard after compressor shuts off	No cause	Common to hear coolant flowing after unit shuts off
Alarm displays "FT" with less than half of condensate water in the tank Spring is possibly broken	Spring is possibly broken	Replace a new spring

DISASSEMBLY

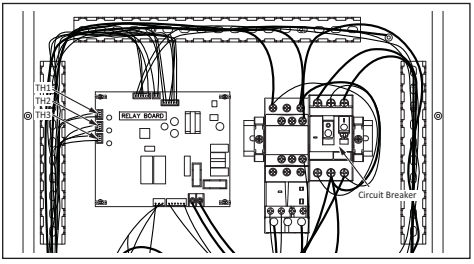
Disassembly



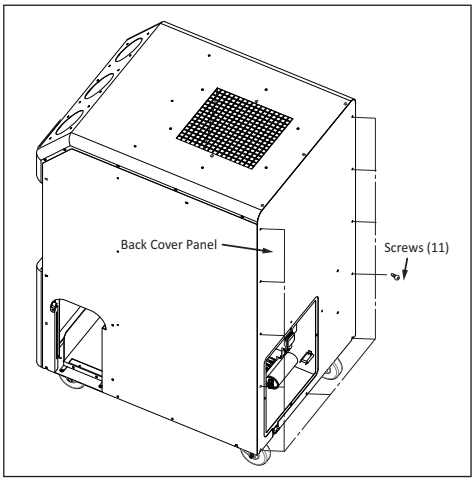
1) Remove the drain tank.
2) Remove two (2) support lines and remove front panel.
3) Take out the twelve (12) screws, and then remove the cooling air duct.



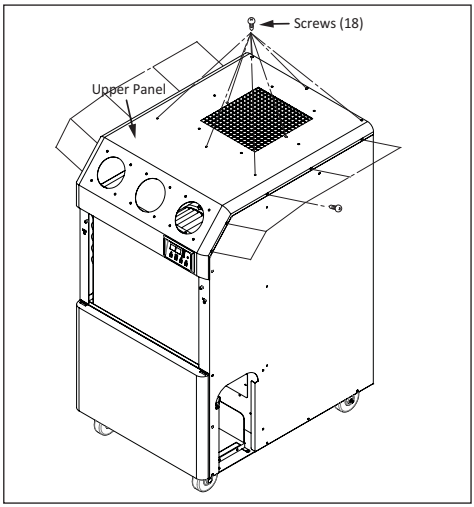
4) Take out the four(4) screws, and then remove the service panel.



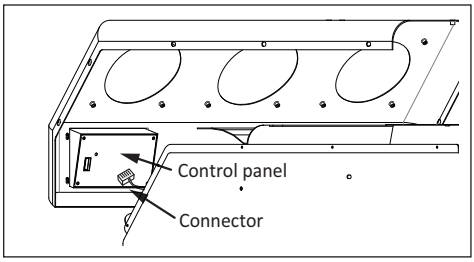
5) Off the circuit breaker. (For safety)



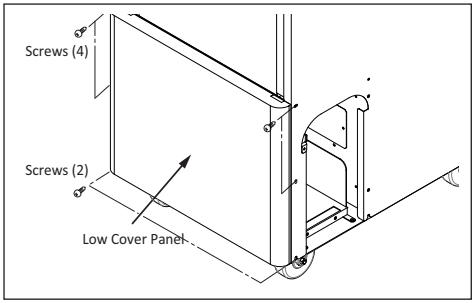
6) Take out eleven (11) screws, and then remove the back cover panel.



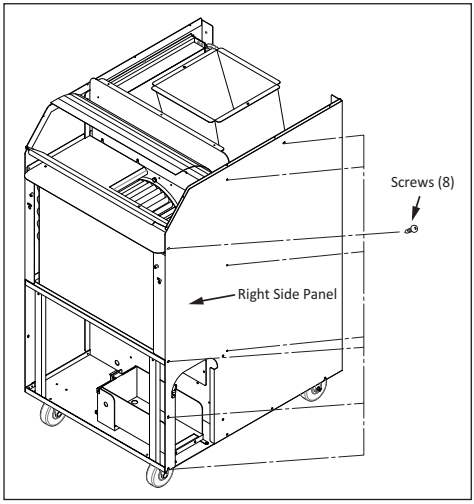
7) Take out the eighteen (18) screws, and then remove the upper panel.



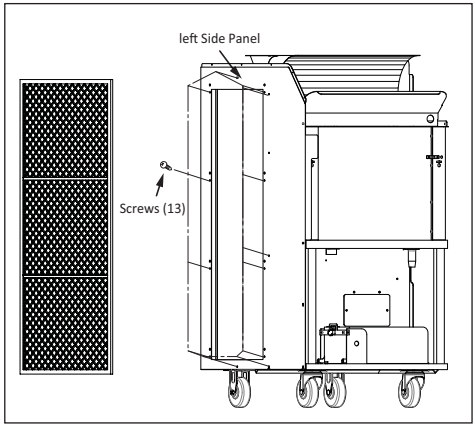
8) Unfasten the connector from the control panel and then remove the front panel.



9) Take out the four (4) screws. Unfasten two (2) screws to a half point and then remove the low cover panel.

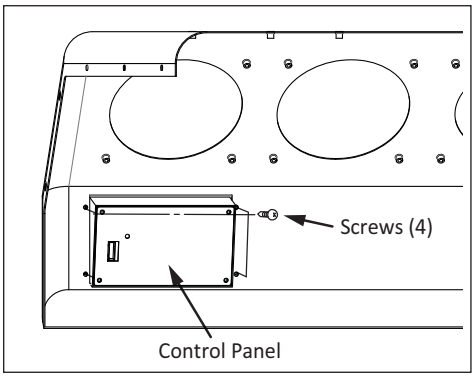


10) Take out the eight (8) screws, and then remove the right-side panel.



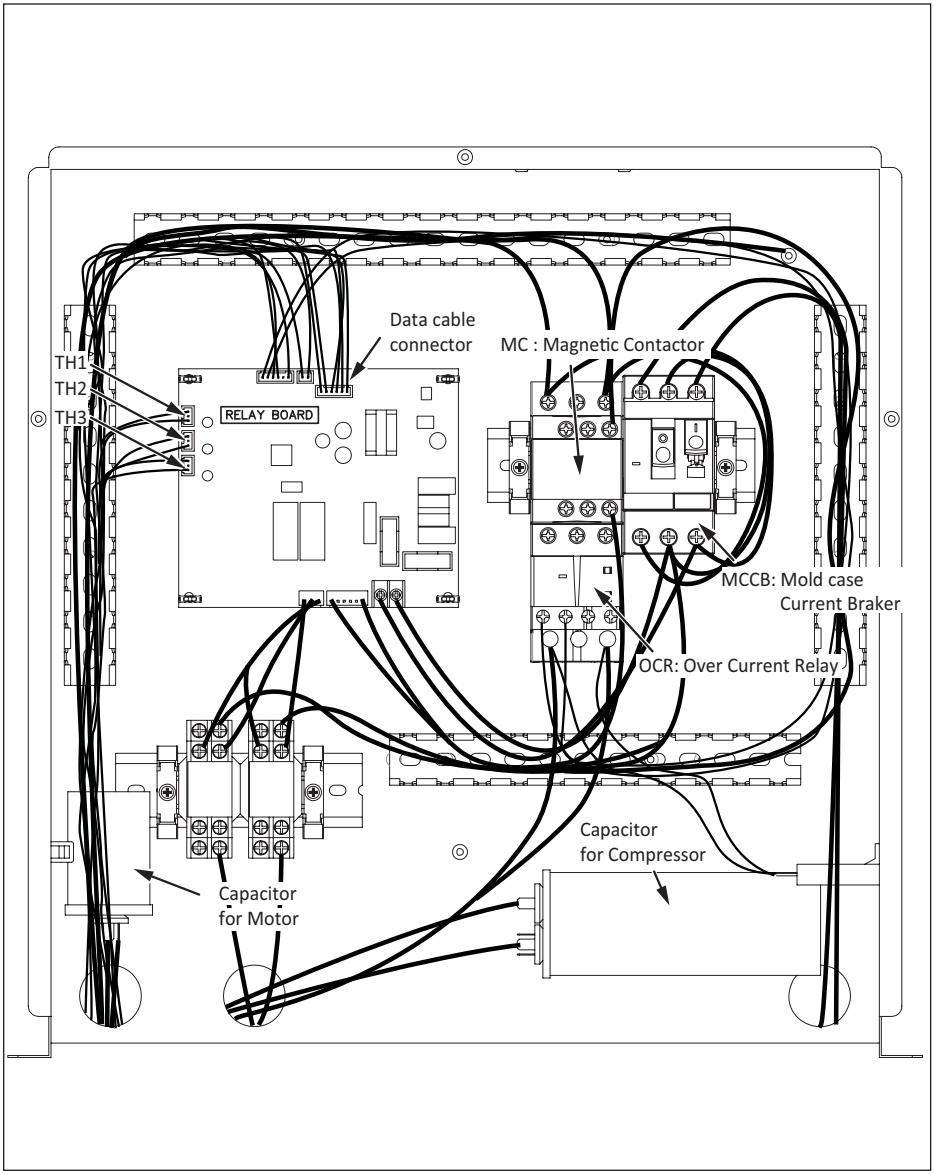
11) Remove the air filter from the back panel. Take out the thirteen (13) screws, and then remove the left-side panel.

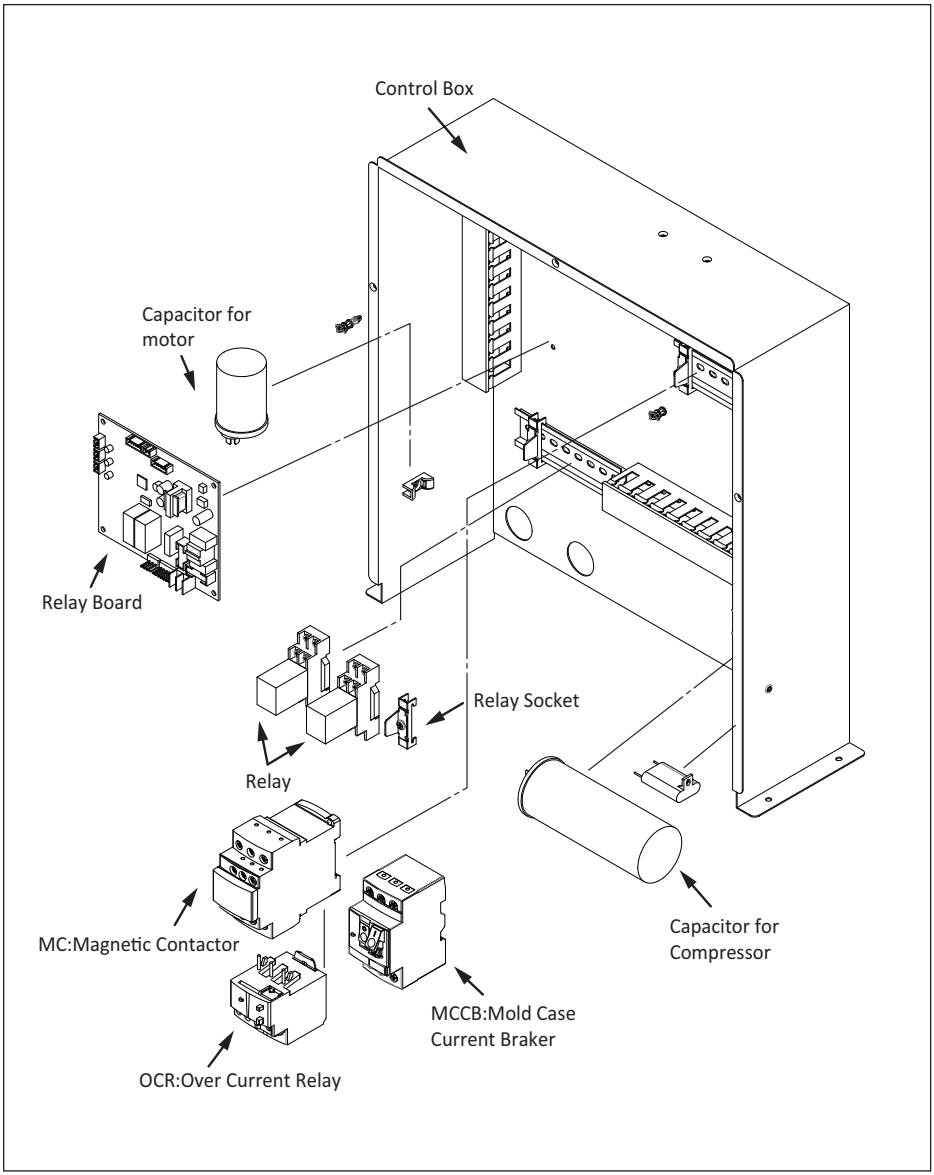
Control Panel Removal



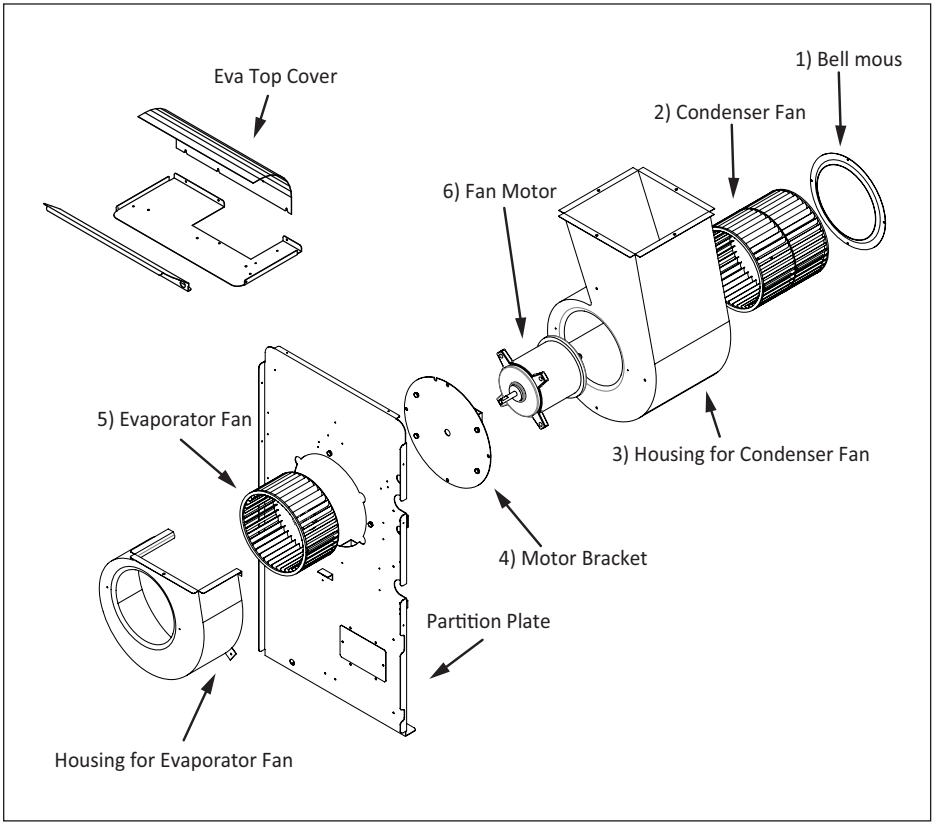
1) Take out the four (4) screws, and then remove the control panel.

Electrical parts and relay board removal




Control Box
Capacitor for
motor
Relay Board
Relay Socket
Relay
MC:Magnetic Contactor
MCCB:Mold Case
Current Braker
OCR:Over Current Relay
Capacitor for
Compressor

Fan Motor Removal



1) Take off the two (4) bolts , and then remove the bell mouse.
2) Loosen the set screw with a hex key, and then remove the condenser fan.
3) Take off the three (3) nuts , and then remove the condenser fan housing.
4) Take off the four (4) nuts, and then remove the fan motor together with the motor bracket.
5) Loosen the set screw with a hex key, and then remove the evaporator fan.
6) Take out the four (4) nuts, and then remove the fan motor.

REFRIGERANT SYSTEM REPAIR

Brazing

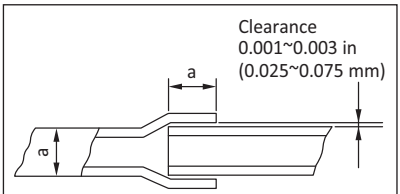
- In the event of a leak, obstruction, or trouble in the refrigerant system of the unit, replace or repair the defective component. After replacing defective component, braze all connections.

1) Proper brazing techniques

- When brazing, use a slightly reduced flame. Oxyacetylene is commonly used since the flame condition can be easily judged and adjusted. Unlike gas welding, a secondary flame is used for brazing. Properly preheat the base metal according to the shape, size and thermal conductivity of the brazed fitting.
- The most important point in flame brazing is to bring the entire brazed fitting to a proper brazing temperature. Care should be taken not to cause overflow of the brazing filler metal, oxidation of the brazing filler metal, or filler metal deterioration due to overheating the flux.

2) Brazed fittings and fitting clearance

- In general, the strength of the brazing filler metal is lower than that of the base metal. As such, the shape and clearance of brazed fittings are very important. Concerning the shape of brazed fittings, adhesive area must be maximized. In addition, the clearance of the brazed fitting must be minimized so that the brazing filler metal will flow into the fitting via capillary action.



Clearance From The Pipe Fitting and Tubing.

3) Cleaning brazing filler metal and piping

- When the refrigerant system has been opened, exposure to heat may cause the brazing filler metal to stick to the inside and outside of the piping. Brazing filler metal may also combine with oxygen in the air to form an oxide film. In addition, grease and oils may stick to the pipe during handling. All these factors will reduce the effectiveness of brazing. Therefore, excess brazing filler metal must be removed with sand paper, and by thorough cleaning with a solvent such as Trichlene.

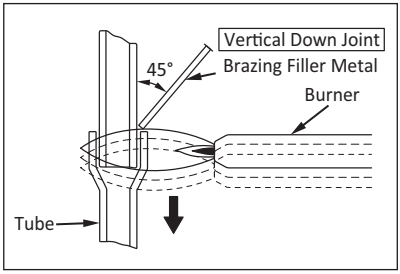
4) Dry Nitrogen gas use

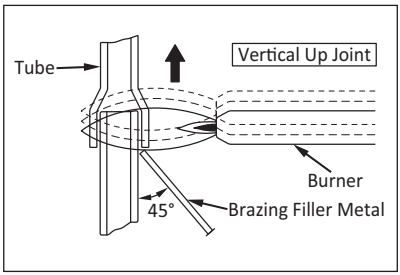
- During brazing, the inside of the pipe undergoes an oxidative reaction due to the brazing flame. Introduce dry nitrogen gas (0.3 gal/min (1 L/min); adjust with the flow regulator) through the pinch-off tube of the refrigerant cycle to prevent oxidation.

NOTE:Do not get foreign matter such as dirt, water, or oil into the piping.

5) Vertical joints

- For vertical joints, heat the entire brazed fitting to the proper brazing temperature. Bring the brazing filler metal into contact with the fitting so that the brazing filler metal begins to flow.
- Stop heating the fitting as soon as the brazing filler metal has flown into the gap (clearance). Since the brazing filler metal flows easily into portions heated to the proper temperature, the entire fitting must be kept at the proper brazing temperature.





Charging the System with R-410A Refrigerant

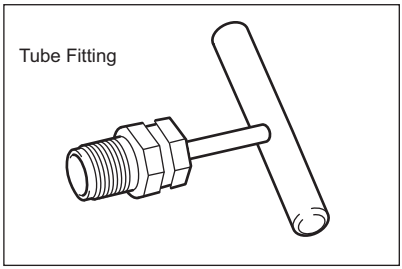
- Always ensure that the refrigerant system has been properly evacuated before charging with the specified amount of R-410A.
- Equipments is only for R-410A.
- Liquid charge (no gas charge).
- Make sure not to use more than 90 % of the initial weight of R-410A in the cylinder.

⚠ WARNING

- When handling refrigerant (R-410A), the following precautions should always be observed:
  - Always wear proper eye protection while handling refrigerant.
  - Maintain the temperature of the refrigerant container below 104 °F (40 °C).
  - Perform repairs in a properly ventilated area. (Never in an enclosed environment.)
  - Do not expose refrigerant to an open flame.
  - Never smoke while performing repairs, especially when handling refrigerant.
  - Be careful the liquid refrigerant does not come in contact with the skin.
- If liquid refrigerant strikes eye or skin:
  - Do not rub the eye or the skin.
  - Splash large quantities of cool water on the eye or the skin.
  - Apply clean petroleum jelly to the skin.
  - Go immediately to a physician or to a hospital for professional treatment

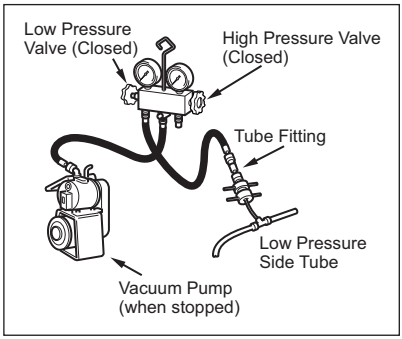
For year 2010~2011 production
(serial no. I0910010001~I0911129999)

Connection of gauge manifold



1) Connect the charging hoses (low pressure side) for the gauge manifold to the tube fitting.

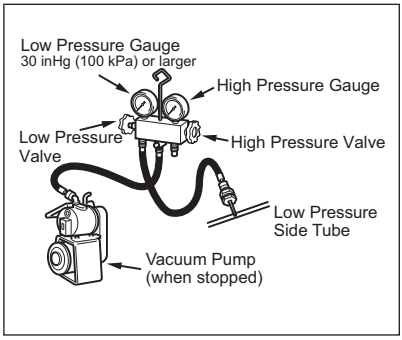
NOTE: Connect the hoses using care not to mistake the high pressure side for the low pressure side and vice versa.



2) Connect the charging hose at the center of the gauge manifold to the vacuum pump.

Evacuation

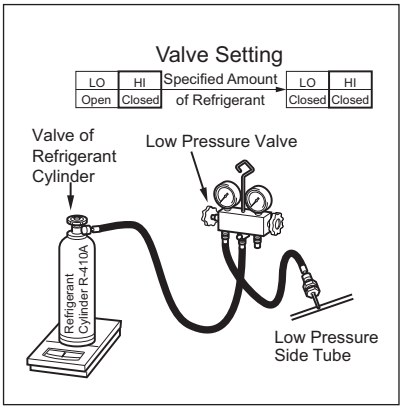
1) Open the low pressure valve (LOW) of the gauge manifold.
2) Turn on the vacuum pump to start evacuation.(Evacuate the system for approximately 30 min.)
3) When the low pressure gauge indicates 30 inHg(100 kPa), turn off the vacuum pump and close the Low pressure valves of the gauge manifold.
4) Leave the high pressure valve and the low-pressure valve of the gauge manifold closed for five min or more, and confirm that the gauge pointer does not return to zero.



Refrigerant Charging Work

Refrigerant charging

1) Remove the charging hose from the vacuum pump, and connect it to the refrigerant cylinder (R-410A).
2) Loosen the nut on the gauge manifold side of the charging hose. Open the valve of the charging hose. Open the valve of the refrigerant cylinder. After air purging, tighten this nut and close the valve of the refrigerant cylinder.
3) Securely place the refrigerant cylinder on a scale with a weighing capacity of 70 lb (30 kg) that is graduated by 0.2 oz (5 g).



4) Open the high pressure valve of the gauge manifold and the valve of the refrigerant cylinder. Charge the system with refrigerant to the specified amount.Standard Amount of Refrigerant:
   - 700881 : 61oz (1730g)

CAUTION

The amount of refrigerant charged has a great effect on the cooling capacity of the unit. Charge to the specified amount,always observing the scale graduations while charging.

5) Close the high pressure valve of the gauge manifold and the valve of the refrigerant cylinder.

WARNING

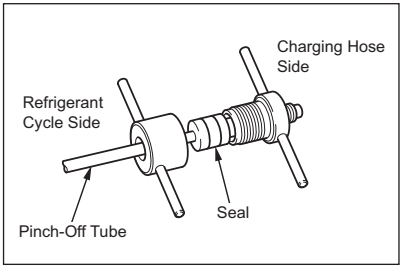
- Do not attempt any repair on a charged system.

WARNING

- Before checking for gas leaks, fully confirm that there is nothing flammable in the area to cause an explosion or fire. Contact of refrigerant with an open fire generates toxic gas.

For year 2012~present production
(serial no. I0912010001~)

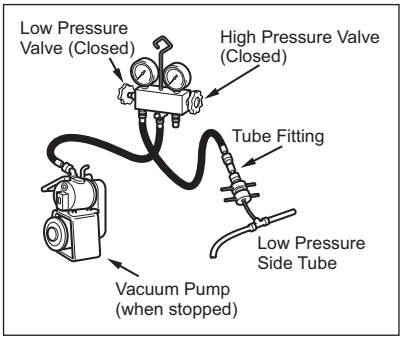
Connection of gauge manifold



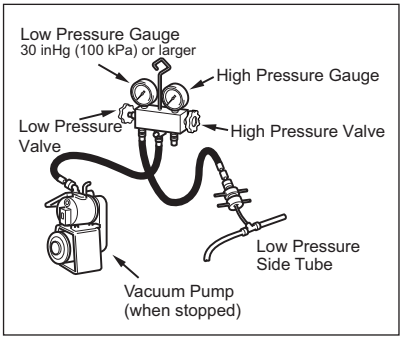
1) Properly remove the crushed end of the pinch-off tube at the high pressure side and the low pressure side of the refrigerant cycle with a pipe cutter.
2) Fit the process tube fitting to the pinch-off tube on both sides.
3) Connect the charging hoses (low pressure side) for the gauge manifold to the tube fitting.

NOTE: Connect the hoses using care not to mistake the high pressure side for the low pressure side and vice versa.

4) Connect the charging hose at the center of the gauge manifold to the vacuum pump.



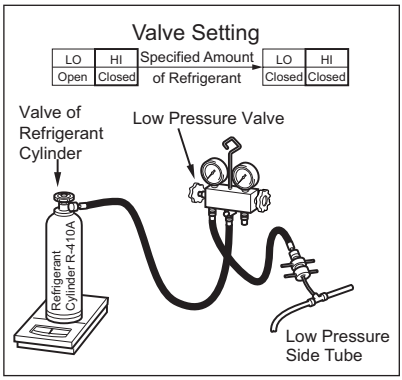
Evacuation



1) Open the low pressure valve (LOW) of the gauge manifold.
2) Turn on the vacuum pump to start evacuation.(Evacuate the system for approximately 30 min.)
3) When the low pressure gauge indicates 30 inHg(100 kPa), turn off the vacuum pump and close the Low pressure valves of the gauge manifold.
4) Leave the high pressure valve and the low-pressure valve of the gauge manifold closed for five min or more, and confirm that the gauge pointer does not return to zero.

Refrigerant Charging Work

(1)Refrigerant charging



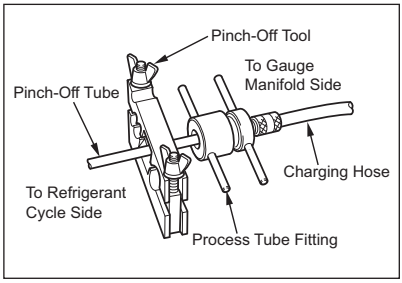
1) Remove the charging hose from the vacuum pump, and connect it to the refrigerant cylinder (R-410A).
2) Loosen the nut on the gauge manifold side of the charging hose. Open the valve of the charging hose. Open the valve of the refrigerant cylinder. After air purging, tighten this nut and close the valve of the refrigerant cylinder.
3) Securely place the refrigerant cylinder on a scale with a weighing capacity of 70 lb (30 kg) that is graduated by 0.2 oz (5 g).
4) Open low the high pressure valve of the gauge manifold and the valve of the refrigerant cylinder. Charge the system with refrigerant to the specified amount. Standard Amount of Refrigerant:
   - 700881 : 61oz (1730g)

CAUTION

The amount of refrigerant charged has a great effect on the cooling capacity of the unit. Charge to the specified amount,always observing the scale graduations while charging.

5) Close the high pressure valve of the gauge manifold and the valve of the refrigerant cylinder.

(2)Removal of gauge manifold



1) Crimp the pinch-off tube with a pinch-off tool.
2) Remove the gauge manifold and the process tube fitting. Crush the end of the pinch-off tube.
3) Braze the end of the pinch-off tube.
4) Ensure that a gas leak is not present at the pinched off portion and the brazed end.

WARNING

- Do not attempt any repair on a charged system.

WARNING

- Before checking for gas leaks, fully confirm that there is nothing flammable in the area to cause an explosion or fire. Contact of refrigerant with an open fire generates toxic gas.